

SR 167 HOT LANES PILOT PROJECT TOLL SETTING

BRIEFING PAPER

Prepared for the
November 2007 TRANSPORTATION COMMISSION MEETING

Prepared By: Patty Rubstello, Traffic Policy Engineer
Reviewed By: Greg Selstead, Director, Tolling Operations
Approved By: Ted Trepanier, Co-Director Maintenance and Operations
Craig Stone, Deputy Regional Administrator - UCO

PURPOSE:

The purpose of this workshop is to cover three areas with regards to toll setting on SR 167:

1. Provide an overview of other HOT lanes in operation across the country covering the following areas:
 - a. HOT Lane Goals
 - b. HOV Policies
 - c. Minimum and Maximum Rates
 - d. How Rates are Applied
 - e. Enforcement
2. Provide Transportation Commission with WSDOT's approach for implementing HOT lanes on SR 167:
 - a. HOT Lane Goals
 - b. HOV Policies
 - c. How Rates are Applied
 - d. Enforcement
3. Provide Transportation Commission with overview of toll rate analysis on the SR 167 HOT Lanes:
 - a. Background on how the rates were developed
 - b. Minimum and Maximum Rate observations

ACTION/OUTCOME:

Proceed with the following schedule to setting the minimum and maximum toll rate for SR 167 HOT Lanes:

November 14th, 2007 – Working session held in Olympia between Commission and WSDOT.

December 11th, 2007 – CR 102 is approved by the Commission.

Early January, 2008 – Commission holds public meeting in the SR 167 corridor.

January 22nd, 2008 – CR 103 hearing held in Olympia to adopt toll rates.

BACKGROUND:

The Washington State Transportation Commission is responsible for setting the toll rate for the SR 167 HOT lanes. Specifically RCW 47.56.403 states, “the schedule of toll charges for high-occupancy toll lanes must be established by the transportation commission.” WSDOT, as the lead agency for the development, implementation and operations of SR 167 HOT lanes has developed a toll rate schedule of a minimum and maximum toll rate for the commission’s consideration.

In order to determine what the appropriate minimum and maximum rates should be for SR 167 HOT lanes, two efforts were undertaken. The first effort was to conduct research on the toll rates set for other HOT lane facilities in the U.S. to understand how other experiences may be applied for SR 167. The second effort was to update the Traffic and Revenue Study (conducted in 2005) to take into account recently gathered information about drivers’ willingness to pay on I-405, and to update the traffic volumes based on the latest data available.

What are the tolling objectives on other HOT lane facilities in the United States?

WSDOT contracted with Wilbur Smith Associates to develop a white paper to document what other HOT lanes facilities have done with regards to setting toll rates. This report is attached for reference. The key to setting toll rates is in determining the goals for implementing HOT lanes. Three different primary goals have been identified by operating HOT lane facilities:

- Maximize revenue collected in the toll lanes;
- Manage demand in the toll lanes to ensure free-flow conditions;
- Manage demand in the toll lanes to optimize the distribution of traffic between the general purpose (GP) and HOT lanes – that is, using pricing to fill the tolled lanes to optimum traffic levels.

Four other HOT lanes facilities in the U.S. were examined that could help us understand the SR 167 HOT lanes toll setting and operations. Their operations are briefly summarized here:

1. When the lanes initially were opened, the SR 91 Express Lanes in Orange County, CA focused solely on maximizing revenue with the need to pay back bonds that were issued to fund the facility. Now the SR 91 Express Lanes also considers traffic management goals as well as generating enough revenue to pay off the bonds used to build the lanes.
2. I-15 Managed Lanes in San Diego, CA has the base goal of ensuring free-flow conditions, specifically California level of service “C”, essentially maintaining about 60 miles per hour; I-15 is also specifically challenged to generate enough revenue to cover its operation and maintenance cost for the lanes.

3. I-25 HOT lanes in Denver, CO also has the base goal of ensuring free-flow conditions while maintaining travel time and reliable trips for buses.
4. I-394 MnPass Lanes in Minneapolis, MN aims to maximize the efficiency of the managed lanes by allowing the lanes to operate as close as possible to their maximum capacity.

For SR 167, RCW 47.56.403 states the goal to be “*to ensure that toll-paying single-occupant vehicle users are only permitted to enter the lane to the extent that average vehicle speeds in the lane remain above forty-five miles per hour at least ninety percent of the time during peak hours*”. This goal would be similar to I-394 in Minneapolis.

What are the minimum and maximum rates of other HOT facilities?

In the case of SR 91 and I-25, a time of day toll rate schedule is used. SR 91 has a schedule for each day of the week by each hour. I-25 has one rate schedule used for every day and it varies by time periods. I-15 and I-394 both use dynamic pricing where the toll rate adjusts based on traffic conditions. They both do have a minimum and maximum rate.

Exhibit 1 - Current minimum and maximum rates for each facility:

Facility	Project Length	Minimum Toll	Maximum Toll or Highest Toll Charged
I-394	9 miles	\$0.25 per section (\$0.50 for full-length trip)	\$8.00
I-15	8 miles	\$0.50 ⁽¹⁾	\$8.00 ⁽²⁾
91 Express Lanes	10 miles	\$1.15 during overnight hours; \$1.85 during midday hours	\$6.65 to \$9.50 during evening peak hours, depending on day of week
I-25 Express Lanes	5 to 7 miles, depending on access point	\$0.50	\$3.25
⁽¹⁾ Consideration is being given to increasing the minimum to \$1.25 to enhance revenues. ⁽²⁾ The published maximum toll in charts on Sandag’s website is \$4, although rates can go as high as \$8 when needed to meet the project’s speed objective.			

What does the SR 167 Traffic and Revenue Report say?

Wilbur Smith Associates (WSA) recently updated the 2005 Traffic and Revenue Report to reflect new data obtained over the last two years. In addition, they conducted two additional model runs to see how various assumptions would influence the toll rates.

The previous base model was updated to reflect current traffic volumes on SR 167, incorporate the stated preference survey conducted for I-405, update access locations based on the current design and use the current tolling algorithm concept. The

assumption that most influence the change in toll rates and revenues was the survey information used from I-405. This updated model is called the New Base model.

The second model used all of the updated information used in the New Base model except for the new survey information. The 2005 value-of-time assumptions were used instead. This model is called the Higher VOT model.

The third model used the New Base model but increased the traffic by 10%. This effort was to see what those abnormally high traffic days would do to the toll rates. This model is called the Higher Traffic model.

Exhibit 2 (Page 5) shows the toll rates as determined from each model by time periods in the years 2008, 2010, and 2012. The rates which are \$5.00 or higher have been highlighted. The highest that the rate gets is \$10.00 in the Higher VOT model and the Higher Traffic model in 2012. The New Base model shows \$8.00 as the highest toll rate.

Exhibit 3 (page 6) shows the total revenue projected for the 4 year pilot fore each model used including the 2005 model.

Exhibit 2 *
Toll Rate by Direction

Time Period	Toll Rates to Maximize Usage(1)					
	New Base(2)		Higher VOT(3)		Higher Traffic (4)	
	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound
2008						
AM Peak 1 (530-700 a.m.)	\$1.00	\$0.50	\$2.00	\$0.50	\$1.75	\$0.50
AM Peak 2 (700-800 a.m.)	0.75	0.50	2.00	0.50	2.00	0.50
AM Shoulder (800-900 a.m.)	0.50	0.50	0.50	0.50	0.50	0.50
Midday (900 a.m.-230 p.m.)	0.50	0.50	0.50	0.50	0.50	0.50
PM Shoulder 1 (230-400 p.m.)	0.50	0.75	0.50	1.75	0.50	2.25
PM Peak 1 (400-500 p.m.)	0.50	2.25	0.50	5.00	0.50	7.00
PM Peak 2 (500-600 p.m.)	0.50	1.75	0.50	4.00	0.50	5.50
PM Shoulder 2 (600-700 p.m.)	0.50	0.50	0.50	1.00	0.50	1.50
2010						
AM Peak 1 (530-700 a.m.)	\$1.00	\$0.50	\$2.50	\$0.50	\$2.25	\$0.50
AM Peak 2 (700-800 a.m.)	1.00	0.50	2.50	0.50	2.50	0.50
AM Shoulder (800-900 a.m.)	0.50	0.50	0.50	0.50	0.75	0.50
Midday (900 a.m.-230 p.m.)	0.50	0.50	0.50	0.50	0.50	0.50
PM Shoulder 1 (230-400 p.m.)	0.50	1.00	0.50	3.25	0.50	4.50
PM Peak 1 (400-500 p.m.)	0.50	3.50	0.50	9.00	0.50	8.00 (5)
PM Peak 2 (500-600 p.m.)	0.50	2.75	0.50	7.00	0.50	7.00 (5)
PM Shoulder 2 (600-700 p.m.)	0.50	0.75	0.50	2.50	0.50	2.00 (5)
2012						
AM Peak 1 (530-700 a.m.)	\$1.50	\$0.50	\$3.50	\$0.50	\$3.25	\$0.50
AM Peak 2 (700-800 a.m.)	2.25	0.50	4.50	0.50	5.00	0.50
AM Shoulder (800-900 a.m.)	0.75	0.50	1.00	0.50	1.25	0.50
Midday (900 a.m.-230 p.m.)	0.50	0.50	0.50	0.50	0.50	0.50
PM Shoulder 1 (230-400 p.m.)	0.50	3.00	0.50	6.50	0.50	10.00 (6)
PM Peak 1 (400-500 p.m.)	0.50	8.00	0.50	10.00	0.50	10.00 (6)
PM Peak 2 (500-600 p.m.)	0.50	2.50	0.50	10.00	0.50	10.00 (6)
PM Shoulder 2 (600-700 p.m.)	0.50	1.25	0.50	3.75	0.50	3.50 (5)

(1) Expressed in 2008 dollars.

(2) New Base Scenario includes updated assumptions regarding willingness to pay and some network changes for validation to updated traffic volumes.

(3) Higher VOT (Value Of Time) Scenario includes original value-of-time assumptions from 2005 study, updated traffic volumes, and some network changes from New Base.

(4) Higher Traffic Scenario includes same assumptions as New Base but with 10 percent higher traffic volumes.

(5) Very little sensitivity to toll rates; most of available capacity may be taken up by HOV traffic.

(6) Very little sensitivity to toll rates.

* Provided by Wilbur Smith Associates

Exhibit 3
Estimated Annual Gross Toll Revenue

Year	Annual Gross Toll Revenue							
	In 2008 Dollars(1)				Adjusted for Financial Planning Purposes(2)			
	2005 Study	New Base(3)	Higher VOT(4)	Higher Traffic(5)	2005 Study	New Base(3)	Higher VOT(4)	Higher Traffic(5)
2008	\$1,045,000	\$735,000	\$1,654,000	\$1,172,000	\$999,000	\$708,000	\$1,455,000	\$1,003,000
2009	1,537,000	1,026,000	\$2,402,000	1,781,000	1,449,000	973,000	1,927,000	1,435,000
2010	1,955,000	1,238,000	\$3,013,000	2,338,000	1,818,000	1,155,000	2,204,000	1,773,000
2011	2,632,000	1,920,000	\$4,150,000	3,223,000	2,360,000	1,758,000	2,941,000	2,274,000
2012	3,544,000	2,978,000	\$5,716,000	4,442,000	3,065,000	2,677,000	3,923,000	2,915,000
Percent Difference from 2005 Study								
2008		-30	58	12		-29	46	0
2009		-33	56	16		-33	33	-1
2010		-37	54	20		-36	21	-2
2011		-27	58	22		-26	25	-4
2012		-16	61	25		-13	28	-5

NOTE: First year revenues have been reduced by 30 percent to take into account the effects of ramp-up in demand; second-year revenues have been reduced by 10 percent.

(1) From traffic analysis, reflecting values of time in 2008 dollars.

(2) Adjustments reflect potential impact of inflation on toll rates, potential impact of dynamic pricing on toll rates in transition periods, and potential impacts of transponder distribution levels in off-peak periods.

(3) New Base Scenario includes updated assumptions regarding willingness to pay and some network changes for validation to updated traffic volumes.

(4) Higher VOT Scenario includes original value-of-time assumptions from 2005 study, updated traffic volumes, and some network changes from new Base.

(5) Higher Traffic Scenario includes same assumptions as New Base but with 10 percent higher traffic volumes.

* *Provided by Wilbur Smith Associates*

What other issues are important to consider when setting toll rates?

A major issue in traffic modeling needs to be understood before establishing toll rates: traffic models are only as good as the data used. With SR 167, the most current traffic volumes have been used in this latest assessment. Additionally, traffic growth was re-evaluated between 2005 and 2008 and adjusted as appropriate. While traffic information is as good as we can get, the available information on drivers' value of time is *much less reliable*. We will not fully understand the value of time for SR 167 drivers until we actually start to operate the HOT lanes. To further complicate matters, other facilities have witnessed drivers' willingness to pay increase beyond the *modeled* expectations once these facilities have started operating.

Therefore in determining rates, we can not rely solely on results from project specific models. Looking at other similar facilities currently under operation also needs to be carefully considered. With that, I-394 in Minneapolis appears to be the most similar to SR 167 in both operations and configuration.

In looking at three days of HOT lane toll rates on I-394, the typical minimum toll rate is \$0.75 even though the minimum rate allowed is \$0.50. This is relatively consistent across all three days. The maximum toll rate actually varied between \$5.80 and \$8.00. In talking with Wilbur Smith Associates who are one of the consultants working for MnDot on this project, the \$8.00 toll rate typically is hit when there is a non-reoccurring event (incident) on the roadway.

Other items to consider are setting the minimum rate to cover at least the cost of processing the transaction and also setting the maximum rate high enough so that it does not force the lane to frequently switch to 'HOV Only' operations. Public acceptance of the maximum rate is also important. Setting the rate too high might only further the miss conceptions that HOT lanes are "Lexus Lanes".

How will WSDOT operate the HOT Lanes?

HOURS OF OPERATION - Currently the HOV lanes on SR 167 operate only between 5 am and 7 pm. Outside of these times the HOV lane operates as an additional general purpose lane.

Because congestion and other traffic events do not follow a strict daily schedule, and because the HOT lanes will provide WSDOT with greater capabilities to manage both the HOT lanes and facilitate maximized throughput on all lanes of SR 167, it is possible that the HOT lanes will run tolling operations earlier or later each day than the SR 167 HOV lanes operate today.

It is WSDOT's goal to run tolling operations when warranted by traffic conditions to help maximize throughput along SR 167. WSDOT will regularly monitor the HOT lanes and the calculated toll rates and open the HOT lanes to all traffic only when conditions have calmed to a point where congestion is no longer likely for an extended period. To the driver, this means that HOT lanes may operate in a tolled condition longer than the hours of operations for the current SR 167 HOV lanes.

HOV POLICY – Since the inception of the pilot project, WSDOT has planned that the HOT lanes be non-tolled for two plus person carpools, vanpools and transit as is the current HOV policy. The rationale in doing this is twofold. First, SR 167 was chosen to test HOT lanes because it was the only corridor where the HOV lane was underutilized at the two plus person carpool designation. Second, if we required all users to pay a toll, except for "transit and vanpool vehicles owned or operated by any public agency" per RCW 47.56.403, more than 80% of the current users of the SR 167 HOV lane would no longer be allowed in the lane without paying a toll. WSDOT saw this to be a 'take away' from an active user group of our system and did not feel that doing this at the start of the pilot project was in the best interest of getting public acceptance.

DISCUSSION:

WSDOT Toll Operations & 167 Project staff will provide additional background on the other facilities deployed across the country, how the SR 167 HOT Lanes will operate and how revenue generated during the current biennium will be managed and spent.

For further information, contact: Patty Rubstello, UCO Traffic Policy Engineer, (425) 450-2720 or David Pope, WSDOT Tolls Policy & Planning Manager, (253) 534-4673.